

SUMMER VACATION HOMEWORK

Class - VIII | Mathematics | Academic Year 2026–27
BY – RAJAN NIVAS (TGT MATHS)

Chapter 1: A Square and A Cube

(Based on Ganita Prakash — NCERT)

Multiple Choice Questions (MCQ)

Each question carries 1 mark. Circle the correct option.

Q1. Which of the following numbers is NOT a perfect square?

- (a) 1024 (b) 2025
(c) 2048 (d) 3136

Q2. The square root of 1764 is:

- (a) 38 (b) 42
(c) 44 (d) 46

Q3. How many perfect squares lie between 100 and 200?

- (a) 3 (b) 4
(c) 5 (d) 6

Q4. A perfect square can NEVER end with which digit?

- (a) 1 (b) 6
(c) 8 (d) 9

Q5. If $n^2 = 4096$, then n is equal to:

- (a) 54 (b) 62
(c) 64 (d) 72

Q6. The sum of the first 10 odd natural numbers is:

- (a) 81 (b) 100
(c) 99 (d) 121

Q7. Which of the following is a perfect cube?

- (a) 125 (b) 216
(c) 343 (d) All of these

Q8. The cube root of 15625 is:

- (a) 15 (b) 25
(c) 35 (d) 45

Q9. How many times is locker number 36 toggled in the locker puzzle?

- (a) 4 (b) 6
(c) 9 (d) 8

Q10. Which of the following numbers has an ODD number of factors?

- (a) 12 (b) 18
(c) 49 (d) 60

Q11. The value of $\sqrt[3]{-512}$ is:

- (a) -8 (b) 8
(c) -64 (d) Not defined

Q12. 1729 is called the Hardy–Ramanujan number because:

- (a) It is a prime number (b) It is the sum of two cubes in two ways
(c) It is a perfect square (d) Ramanujan discovered it

Q13. The number of zeros at the end of 700^2 is:

- (a) 2 (b) 3
(c) 4 (d) 6

Q14. If $35^2 = 1225$, then $36^2 = ?$

- (a) $1225 + 35$ (b) $1225 + 71$
(c) $1225 + 72$ (d) $1225 + 36$

Q15. Which prime factorisation confirms 216 is a perfect cube?

- (a) $2^3 \times 3^3$ (b) $2^2 \times 3^4$
(c) $2^4 \times 3^2$ (d) $2^3 \times 3^2 \times 6$

Q16. Between the squares of 25 and 26, how many natural numbers lie?

- (a) 48 (b) 49
(c) 50 (d) 51

Q17. The smallest number by which 72 must be multiplied to make it a perfect square is:

- (a) 2 (b) 3
(c) 6 (d) 8

Q18. $3 + 6 = 9$, $6 + 10 = 16$. This illustrates that:

- (a) Sum of triangular numbers gives squares (b) Perfect squares are always odd
(c) Cube numbers are triangular (d) All even numbers are squares

Q19. Which of the following is the correct statement?

- (a) Every perfect cube ends in 8 (b) Cube of an odd number is always even
(c) Cube of a negative number is negative (d) A cube can end with exactly 2 zeros

Q20. The nth odd number is:

- (a) $2n$ (b) $2n + 1$
(c) $2n - 1$ (d) $n + 1$

Real-Life Project Work

Attempt any ONE projects. Each project carries 10 marks. Be creative, use colours, and present neatly.

PROJECT 1: THE LOCKER PUZZLE — SIMULATION

Objective: Re-enact the locker puzzle with 25 lockers (1–25) and document which lockers remain open. Understand the connection to perfect squares through hands-on activity.

Steps:

- Draw 25 boxes on a large sheet representing lockers (label them 1 to 25).
- Use a pencil tick (open) and cross (closed) to simulate each person's action (Person 1 to Person 25).
- Record a table showing: Locker Number | Number of times toggled | Factors of the number | Open/Closed.
- Identify which lockers are open. Write the mathematical conclusion: open lockers = perfect squares.
- Write a short paragraph (6–8 lines) explaining WHY only perfect squares remain open, using the concept of factors.
- Extension: What would happen if there were 50 lockers? List the open lockers.

Submission: Submit as a neat handwritten/printed project file.

PROJECT 2: SQUARE NUMBERS IN ARCHITECTURE

Objective: Investigate where perfect squares and square roots appear in real-world architecture and measurements around you.

Steps:

- Measure the floor area of 3 different rooms in your house (or school) using a measuring tape.
- Check if any floor area is a perfect square. If yes, find the exact side. If not, estimate the side using square root approximation.
- Research and write about 2 famous square/cubic structures in India (e.g., Red Fort's courtyard, Sanchi Stupa).
- Draw a neat diagram of a floor plan and label dimensions.
- Create a mini 'square number art' — draw square grids of sizes 1×1 , 2×2 , 3×3 , ..., 7×7 on graph paper. Colour them differently.
- Write: How are square roots useful for architects and engineers? (minimum 5 sentences)

Submission: Submit as a neat handwritten/printed project file.

PROJECT 3: RAMANUJAN'S NUMBER JOURNEY

Objective: Explore the life and mathematical genius of Srinivasa Ramanujan with a focus on taxicab numbers and his contributions to number theory.

Steps:

- Write a biography of Ramanujan in your own words (minimum 15 sentences). Include his early life, education, and journey to Cambridge.
- Verify that $1729 = 1^3 + 12^3 = 9^3 + 10^3$ using step-by-step calculation.
- Find and verify the two ways 4104 and 13832 can each be expressed as the sum of two perfect cubes.
- Create a 'Number Art' poster showing: Who was Ramanujan? What are Taxicab numbers? Why is 1729 special?

- Design a quiz of 5 questions about Ramanujan's life and mathematics for your classmates.
- Research: Name one Indian mathematician alive today and write 5 facts about their work.

Submission: *Submit as a neat handwritten/printed project file.*

PROJECT 4: CUBE ROOT PATTERNS — SUCCESSIVE DIFFERENCES

Objective: Discover the hidden pattern in successive differences of perfect cubes and connect it to real mathematical sequences.

Steps:

- Write the first 10 perfect cubes: 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000.
- Compute Level 1 differences ($8-1=7$, $27-8=19$, ...), then Level 2 differences, then Level 3 differences.
- Record all three levels in a neatly drawn table.
- Write your observation: At which level do all differences become equal? What is that constant?
- Compare this with perfect squares (which become constant at Level 2). Explain what this suggests about the degree of the polynomial.
- Extension: Predict — at which level will differences of n^4 (1, 16, 81, 256, ...) become constant? Verify with the first 6 terms.

Submission: *Submit as a neat handwritten/printed project file.*

PROJECT 5: SQUARE PAIRS PUZZLE — HAMILTONIAN PATH

Objective: Solve and extend the Square Pairs puzzle from the chapter, discovering connections between number theory and graph theory.

Steps:

- Arrange the numbers 1 to 17 in a row such that every adjacent pair sums to a perfect square. Show your working and all attempts.
- Verify your final arrangement: check every consecutive pair adds to a square.
- Try the circular arrangement with numbers 1 to 32 (every adjacent pair, including last and first, should sum to a square). This is a famous puzzle — attempt it and show your approach.
- Create a graph: Draw each number 1–17 as a node. Connect two nodes with a line if their sum is a perfect square. Shade the path you found.
- Research: What is a Hamiltonian Path in graph theory? Write 4–5 sentences connecting the Square Pairs puzzle to this concept.
- Make up your own version: Can you arrange 1 to 10 so that consecutive sums are all triangular numbers?

Submission: *Submit as a neat handwritten/printed project file.*

Everyone will make one 3 - D model of maths using clay or waste material.

SUMMER VACATION HOMEWORK

EMRS BUDNI

CLASS VIII, SUBJECT ENGLISH

1. READING TASK

Read all the poems from your English textbook. Write in your notebook:

- Name of the poem and the poet
- Five new words with meanings searched from google



EXAMPLE (FIVE NEW WORDS)

1. Serene – calm, peaceful and untroubled
2. Glimmer – shine softly
3. Whisper – speak very softly
4. Wander – move around without a fixed path
5. Eternity – endless time; forever

2. WRITING PRACTICE

Write any three of the following topics in 100–150 words each:

- My Summer Vacation
- My Favourite Teacher
- Importance of Trees
- A Visit to My Village
- My Best Friend
- Clean India Mission



3. CREATIVE ACTIVITY

Make any one project on chart paper:

PARTS OF SPEECH CHART		
PART OF SPEECH	MEANING	EXAMPLES
NOUN	A word that names a person, place, thing or idea.	boy, city, book, happiness
PRONOUN	A word used in place of a noun.	he, she, it, they, we
ADJECTIVE	A word that describes a noun or pronoun.	big, blue, honest, beautiful
VERB	A word that shows action or state of being.	run, jump, is, write, become
ADVERB	A word that describes a verb, adjective or another adverb.	quickly, very, well, here, today
PREPOSITION	A word that shows the relationship between a noun or pronoun and another word.	in, on, at, under, beside, with
CONJUNCTION	A word that joins words or sentences.	and, but, or, because, so
INTERJECTION	A word that expresses strong feeling or emotion.	oh!, wow!, alas!, hurrah!



ARTICLES CHART		
Articles are words used before nouns.		
TYPES	USES	EXAMPLES
A	Used before singular countable nouns starting with a consonant sound.	a boy, a book, a university
AN	Used before singular countable nouns starting with a vowel sound.	an apple, an hour, an honest man
THE	Used before specific nouns, or nouns already known to the reader.	the sun, the earth, the Ganga

SUMMER VACATION HOMEWORK (2026)

Class VIII

Subject: Science

Task 1

Revise all the chapters completed in class and prepare a handwritten summary in key points.

Task 2

Make a colourful chart/model on **any one** topic:

- ☐ Solar System
- ☐ Human Digestive System
- ☐ Water Cycle
- ☐ Types of Friction
- ☐ Conservation of Natural Resources

Task 3

Write 10 examples of **physical changes** and 10 examples of **chemical changes** from daily life.

Learn, Explore and Have Fun!

SUMMER VACATION HOME WORK

SUBJECT: SOCIAL SCIENCE (SST)

CLASS: 8



1. Visit around your home and village and observe the natural element or objects and make a chart with those.

१. अपने घर और गाँव के आसपास जाएँ तथा प्राकृतिक तत्वों या वस्तुओं का अवलोकन करें और उनसे संबंधित एक चार्ट तैयार करें।



2. Identify human actions in your surroundings that result in nature losing her ability to restore and regenerate. What types of interventions would you like to take to restore the nature's cycle.

२. अपने आसपास ऐसी मानवीय गतिविधियों की पहचान करें जिनके कारण प्रकृति अपनी पुनर्स्थापन एवं पुनर्जनन की क्षमता खो रही है। प्रकृति के चक्र को पुनः स्थापित करने के लिए आप किस प्रकार के कदम उठाना चाहेंगे?



Renewable

- Lorem ipsum dolor materials.
- Lorem ipsum dolor materials connocton mattis here.

Non-renewable

- Lorem ipsum dolor materials.
- Lorem ipsum dolor materials connocton mattis here.

3. Find out the renewable and non-renewable resources are available in your region and, make a list with those.

३. अपने क्षेत्र में उपलब्ध नवीकरणीय (Renewable) और अनवीकरणीय (Non-renewable) संसाधनों का पता लगाइए तथा उनकी एक सूची तैयार कीजिए।



4. Find out the implications of extracting the natural resources in your village or locality and suggest the ways that you can take to use the nature's gift in responsible ways.

४. अपने गाँव या क्षेत्र में प्राकृतिक संसाधनों के दोहन के प्रभावों का पता लगाइ तथा यह सुझाव दीजिए कि प्रकृति के उपहारों का जिम्मेदारीपूर्वक उपयोग करने के लिए आप कौन-कौन से उपाय अपना सकते हैं।

Note: Use eco-friendly materials for your chart and creative projects!

कक्षा 8 – गृह कार्य (कोई 4)

क्र.	कार्य	हिंदी
1	कोई टीवी शो / YouTube एपिसोड देखकर 10 वाक्य समीक्षा	
2	"एक गर्मी के दिन बिजली चली गई" पर 100 शब्दों की कहानी	
3	गर्मी, तूफान, बारिश पर 5 कठिन पहेलियाँ (उत्तर सहित)	
4	तरबूज या आम पर नारा + चित्र सहित विज्ञापन	
5	गर्मी के सबसे गर्म दिन की डायरी प्रविष्टि (8-10 वाक्य)	

कक्षा 8 – प्रोजेक्ट (कोई 1)

- लघु नाटिका लेखन – “गर्मी की छुट्टियाँ” या “बिजली जाना” पर 8-10 संवादों का नाटक (पात्र, वेशभूषा सुझाव सहित)।



- साक्षात्कार प्रोजेक्ट – किसी बुजुर्ग का गर्मियों के अनुभवों पर साक्षात्कार (लिखित + फोटो/चित्र)।



कक्षा 8, विषय: संस्कृत

1. प्रश्नोत्तराणि

1. “संहतिः कार्यसाधिका” इत्यस्य अर्थः कः?
2. “अल्पानामपि वस्तुनि” इति वाक्येन किं सूच्यते?
3. अस्मिन् पाठे एकतायाः महत्त्वं कथं वर्णितम्?
4. कः उदाहरणः अत्र प्रस्तुतः?
5. अस्मात् पाठात् का शिक्षा लभ्यते?

2. शब्दरूपाणि

निम्नलिखितानां शब्दानां रूपाणि लिखत—

❖ वस्तु (नपुंसकलिङ्ग)

विभक्ति	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमा			
द्वितीया			
तृतीया			
चतुर्थी			
पञ्चमी			
षष्ठी			
सप्तमी			
सम्बोधनम्			

❖ बालक (पुलिङ्ग)

विभक्ति	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमा			
द्वितीया			
तृतीया			
चतुर्थी			
पञ्चमी			
षष्ठी			
सप्तमी			
सम्बोधनम्			

❖ नारी (स्त्रीलिङ्ग)

विभक्ति	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमा			
द्वितीया			
तृतीया			
चतुर्थी			
पञ्चमी			
षष्ठी			
सप्तमी			
सम्बोधनम्			

3. धातुरूपाणि (लट् लकारे)

कृ (करना)

पुरुषः	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमः पुरुषः			
मध्यमः पुरुषः			
उत्तमः पुरुषः			

भू (होना)

पुरुषः	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमः पुरुषः			
मध्यमः पुरुषः			
उत्तमः पुरुषः			

मिल् (मिलना)

पुरुषः	एकवचनम्	द्विवचनम्	बहुवचनम्
प्रथमः पुरुषः			
मध्यमः पुरुषः			
उत्तमः पुरुषः			

4. “स्वस्य दैनिकदिनचर्यायाः विषये दश वाक्यानि संस्कृते लिखत।”

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

